Infrastructural Facilities in India: District Level Availability Index

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Abstract [*]

The role of infrastructure in fostering economic growth and enhancing public welfare is more pronounced in developing economies like India. At the time of our independence, the national government was unanimous in accepting that a much wider base of infrastructure was the 'sine qua non' of economic development of this country. The complete consensus obviated the need for any debate on this issue and it was taken for granted that infrastructure sector needed both large scale action and outlay. There has been a remarkable growth in the absolute level of such facilities, as well as in the level relative to the size of the nation and population, i.e. in standardized forms, though the performance in terms of efficiency, quality and financial viability has remained circumspect, if not poor. However, a major aspect of this issue has been the wide regional variation in the availability of infrastructural facilities. This has often accentuated regional disparities in socio-economic development and stressed the necessity for an integrated regional development programme. The first step towards this direction is taking a stock of the regional distribution of infrastructural facilities in India. In this paper an attempt has been made towards this direction. It has been observed that there exists considerable regional disparity in infrastructural facilities in India, not only among the states, but within states also. It is also noted that the relative hierarchy has remained quite sticky over time. Thus, the situation is far from comfortable and this issue is to be taken up seriously to keep our economy on track.

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Introduction

Infrastructure means something that lies below or comes before (infra) the 'structure' and provides the base over which the structure of the economy is built. This has to be seen as opposite to the 'superstructure', which is built over and above the structure and is the end result, or, in some sense, the aim of economic development and growth process. The term originated during World War II as a military term to mean 'underlying' structures in the early days of Marshall Plan and has been widely used with varied connotations thereafter. Broadly speaking, 'infrastructure' can be seen as all those activities and services whose contribution to the economy is not the income generated within the sector itself but the sustenance and support that they provide to the income generation in the rest of the economy. The foremost reference to the concept of Infrastructure was by A.O.Hirschman (1958). He differentiated between Direct Productive Activities (DPA) and Social Overhead Capital (SOC). SOC can be seen as infrastructure and is usually defined as comprising "those basic services without which primary, secondary and tertiary productive activities cannot function." In the Nineties, David Aschauer (1990) provided a general purpose definition of infrastructure as a region's "public stock of social and economic overhead capital". The World Bank (1994) in the World Development Report 1994 includes the following in its definition of Infrastructural services: **Public Utilities -** Power, Telecommunications, Piped Water Supply, Sanitation and Sewerage, Solid Waste collection & disposal, Piped Gas; **Public Works -** Roads, Major Dams, Canal Works for Irrigation and Drainage; **Other Transport Sector -** Urban and Inter-urban Roadways, Urban Transport, Ports & Waterways and Airports; **Social Infrastructure -** Basic Education, Primary Health Care and Banking Service.

In the present study similar notion regarding infrastructure has been adopted (the specific facilities selected for investigation have been cited later on). Distinction is made between economic or physical infrastructure and social infrastructure, and various issues regarding infrastructural availability in India have been examined. The paper has been divided into nine parts. In the next section theoretical issues regarding importance of infrastructure in development process have been discussed. The third and fourth section outlines the importance of infrastructure in Indian planning and the objective of the present study. The fifth section discusses the methodology of the study. The subsequent sections discuss the major findings, followed by a short summary.

Infrastructure and Development

The seminal discussion on the relationship between infrastructure and economic development was put forward by Hirschman (1958) himself while he was discussing development strategies. He commented that "enlarged availability of electric power and of transportation facilities are essential preconditions for economic development practically everywhere". He went on to add that at least in this regard "we have a field where economists have given full recognition to the principle of "efficient sequence" (and economists are known not to agree with each other!). According to him "investment in SOC is advocated not because of its direct effect on final output, but because it permits, and in fact invites, DPA (investment) to come in." These ideas were echoed by Rostow (1960) in his theory of 'Stages of Growth', Paul Rosenstein-Rodan (1943) and R. Nurkse (1953) in their version of 'Balanced Growth', and more recently by Aschauer (1990) and Munnell (1990). The World Bank (1994) has also put forward various arguments regarding the benefits accruing to the economy from infrastructure and increased public investment in overhead capital. Hansen (1965), by contrast, was more interested in the differential effect that such investments would have on different socio-economic regions. In what is now famous as Hansen Thesis, he commented that regions can be classified into three types- (a) Congested (b) Lagging and (c) Intermediate. In Congested areas, the marginal social cost of expanding Public Capital (another 'name' often given to infrastructure) would outweigh the marginal social benefit. In Lagging regions the dominant economic activity is agriculture and declining industry, and according to Hansen, the economic impact of infrastructure would be negligible in such areas. Benefits accruing from increased availability of infrastructural facilities would be highest in the Intermediate regions that do not suffer from congestion (associated pollution, shortages, etc.) but have access to quality raw materials, efficient labour and wide market.

Thus, regional study of infrastructural facilities becomes of paramount importance as proper policy formulation would depend on the nature of the regions.

Importance of Infrastructure in India

The role of infrastructure in fostering economic growth and enhancing public welfare is more pronounced in developing economies like India. Here, infrastructure projects and increase in Public Capital Outlay have a two-pronged effect on the development process. In Hirschman's words it has both "Backward and Forward Linkages". On one hand, initiation of infrastructural projects creates demand for labour, land (in most cases) and other "heavy" capital goods like Cement, Iron & Steel, etc. On the other hand, completion of such projects opens up opportunities for a plethora of economic activities and creates a secondary level of employment creation and income generation. Thus, a new road is accompanied by expansion of transport services by local people; a new bridge facilitates trade & commerce, and a new power plant fosters small manufacturing units. In fact, at the time of our independence, the national government was unanimous in accepting that a much wider base of infrastructure was the *'sine qua non'* of economic development of this country. The complete consensus obviated the need for any debate on this issue and it was taken for granted that infrastructure sector needed both large scale action and outlay. During the first 18 years of Planning (1950-51—1968-69) as much as 78% of Total Plan Outlay were devoted to infrastructure – Agriculture, Power, Irrigation, Transport & Communication, and Social Services like Education & Health. It has been because of such paramount importance being attached to the development of the infrastructure in our economic planning that long strides have been made in the physical availability of such facilities in India. There has been a remarkable growth in the absolute level of such facilities, as well as in the level relative to the size of the nation and population, i.e. in standardized forms (Table 1). However, the performance in terms of efficiency, quality and financial viability has remained circumspect, if not poor, and the inadequacy becomes more prominent if we compare them with global standards. India's performance in terms of Per Capita Power Generation, Telephone Connectivity, Road length per thousand people (Road freedom), and Teacher-pupil ratio in Primary Schools are not only far behind the High & Middle Income economies, it is less than even the average for the group of Low Income Countries, to which it belongs. Only in terms of Road Density, Net Irrigated Area as % of total area, Access to safe drinking water and Physicians per million population, it leads the low income countries. But even for these services the figures are far behind the standard maintained by the developed economies. Moreover, apart from the physical size of the infrastructure, the quality of services and the efficiency of the system leaves much scope for improvement. Another major aspect of this issue has been the wide regional variation in the availability of infrastructural facilities. This has often accentuated regional disparities in socio-economic development and stressed the necessity for an integrated regional development programme. The first step towards this direction is taking a stock of the regional distribution of infrastructural facilities in India.

Objective of the Study

The main objective of this study is to look at the regional aspect of distribution of infrastructural facilities in India. The concept of region has been studied at various dimensions and the specific definition adopted differs from one study to another depending on the objective of the study and other factors like data availability, viability of the study, etc. In the present study, as has been discussed in the section on methodological issue, the concept of region is constrained by administrative units, as most data are available only at the administrative unit level. Then also, 'state' as a region seemed as too large a unit to meaningfully reveal the regional dimension of infrastructure and economic development in India. Considerable heterogeneity is present even within each state with several backward districts and advanced districts coexisting. If we stop at the level of state, then we gloss over such intrastate differences and loose much of the information that could have been gathered. Still, most of the existing studies on infrastructure in India have advanced not further than the state level.[i] Keeping this in mind, the present study ventures into a district-level analysis of infrastructural facilities in India.

Methodology of the Study

It has been accepted that a region cannot be so easily labelled as having ‘inadequate’ infrastructure. There are various facets of Infrastructure, and while a region may lack in one or more of the infrastructural services available, it may possess adequate supply of others. Consequently Infrastructure has been subdivided into constituent components: **Physical infrastructure; Financial Infrastructure; and Social Infrastructure.** Further subdivided, the following components of Infrastructure are identified-

(a) Agro-specific Infrastructure - consisting of irrigation infrastructure and agricultural credit (AGINF);

(b) Transport & Communication Infrastructure - consisting mainly of Roads and Railways (TRINF);

(c) Power Infrastructure - represented by % of Villages electrified (POWINF);

(d) Financial Infrastructure - consisting mainly of Banking Services (FININF);

(e) Education Infrastructure - consisting mainly of access to schools and colleges (EDUINF); and

(f) Health Infrastructure - consisting mainly of access to hospitals, dispensaries and medical personnel (HLTINF).

(a), (b) & (c) constitute Physical Infrastructure (PHYINF), and, (e) & (f) constitute Social Infrastructure (SOCINF).

Each of these components of infrastructure themselves consist of several variables /indicators. Separate indices for each of the six components of infrastructure have been constructed. Then a Composite Index of Infrastructure has been constructed, and the analysis is based on those indices. In the present study we accept the reality that significant variables measuring infrastructure are widely dispersed over space (and time) and there is marked inequality among regions regarding the availability of infrastructural facilities. Consequently, the Modified Principal Component Analysis[ii] is used to construct composite indices for each of the groups of variables. (This method of PC analysis first standardises the data by dividing the variable values by their respective mean. Then it determines such a weight vector to be attached to the variables so that the sum of squared projection of them on the composite index is maximum, i.e. the composite index captures maximum variability of the standardised data matrix.)[iii] The first Principal Component has been taken for each of the groups. In this way, single variables measuring each of the six aspects of Infrastructure - Agro-specific, Transport & Communication, Power, Financial, Educational and Health Infrastructure have been constructed. These six variables are thus scale free. Thereafter, PHYINF has been constructed by applying MODPCA on AGINF, TRINF and POWINF; and SOCINF has been constructed by applying the same method on EDUINF and HLTINF.

To get one single indicator of Infrastructural facilities, various methods were used. Firstly, MODPCA was re-used on the factor scores corresponding to the constituent factors of Infrastructure, to arrive at a Final Composite Index of it (INF1). Secondly, the scores of the observations for each of the six constituent factors were added to get the final score (INF2). Thirdly, INF3 was obtained by using MODPCA on the three sub-composite indicators of infrastructure – PHYINF, FININF and SOCINF. The aspects of infrastructure are then studied with the aid of these composite indices.

The analysis of the structure of the Principal Components, the levels of Infrastructural facilities as indicated by these indices and their regional variation were then ventured into.

The study covers all the districts of 15 major states of India - Andhra Pradesh, Bihar, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh And West Bengal. To retain temporal comparability, the 379 districts of these states present at the 1971 census are taken as observations and the later units were suitably adjusted.

Structure of the Principal Components

Before embarking upon the study of the levels of Infrastructure based on the principal components, we must look at the principal components themselves to find out their structure and what they represent.

Total 9 indices were prepared by using MODPCA: 5 Infrastructural components indices – AGINF, TRINF, FININF, EDUINF and HLTINF; 2 further sub-composite components of infrastructure – PHYINF and SOCINF; and 2 composite indices of infrastructure – INF1 and INF3. POWINF is a single index in itself.

It was observed that in all the 9 cases, the first principal component had substantially high explanatory power – almost always above 75% (Table 2a). Only for Health Infrastructure index of 1981 it is below 50% and there the average of the first two principal components was taken[iv]. It is expected that to capture as much variability as possible, taking this step for a single instance out of 30 indices will do no harm to the analysis.

The Latent Vector (or the Weightage Vector used to calculate the Factor scores) revealed that the principal component almost always had assigned positive weightage to the individual variables used – signifying their positive influence on the level of infrastructure (Table 2b and 2c).

It was observed that AGINF attached higher importance to Agricultural Credit than Irrigation Intensity. TRINF attached higher importance to Roads and Railways in all the three years. FININF attached more importance to Bank Branches standardized by Area than by Population, indicating that the Spatial spread of Banking services is more important than Number of people served per branch. EDUINF assigned highest weightage to availability of Colleges and HLTINF attached higher importance to Spatial spread of Hospitals and Dispensaries. The Composite index of Infrastructure (INF1) attached greater importance to AGINF, FININF and TRINF; and (INF3) on Physical Infrastructure among the components. To attach equal importance to the six sub-components of infrastructure, another composite score of Infrastructure (INF4) was constructed which would have equal representation from Agricultural, Transport, Power, Financial, Educational and Health Infrastructure. To do so, a factor score was evolved by using such a Weight Vector so that the Correlation between the factor score and each of the standardized variables used would be equal. In other words, if $Y_i = \Sigma a_j * X_{ij}$; $j = 1, .., k$; $i = 1, .., n$ gives the factor score of i^{th} observation using the k variables; this Equal Correlation Method[v] would imply that $r_1 = r_2 = \ldots = r_k = R$ where r_j = correlation coefficient between Y (the factor score) and the j^{th} variable (j^{th} X), and where X-s are standardized variables. INF4 was thus determined using this equal correlation method on the six components of Infrastructure – AGINF, TRINF, POWINF, FININF, EDUINF and HLTINF. Thus we now have 4 separate composite indices of infrastructure – INF1, INF2, INF3 and INF4. They differ only in the Methodology of their determination but represent the same underlying phenomenon and have close association among themselves.

Indices of Infrastructure: Levels and Variation

The Mean Score, Coefficient of Variation in the scores, Top 10 districts and Bottom 10 districts for each of the indicators for the three time points are given in Table 3. The following features are to be noted.

During 1971, among the three main components of infrastructure, the highest CV was exhibited by PHYINF (1311%). Among individual components, AGINF had a CV of 1502%, followed by FININF (685%). Lowest variation was recorded by EDUINF (41%). Top places in terms of infrastructure were occupied by the metropolitan districts of Calcutta, Delhi, Bombay, Madras along with Allappuzha, Ernakulam and Thiruvananthapuram. The bottom positions were occupied by Barmer, Seoni, Garhwal, Panna and Pithoragarh. However various other districts, though not lacking all the infrastructure facilities, did lag behind in one or more aspects of infrastructure, specially the Garhwal areas were severely lacking physical infrastructure.

In 1981, the regional variation seems to have decreased for all the components except financial infrastructure and health infrastructure. Highest variation was observed for Agro-infrastructure and the lowest for Educational infrastructure. The four metropolitan districts retained their top positions along with Alappuzha. They were joined by Hyderabad and Gandhinagar, whereas Ernakulam and Thiruvananthapuram lost there position mainly due to slippage in terms of social infrastructure and physical infrastructure respectively.

During the period 1981-91, the variation in infrastructure narrowed down for each of the components. The highest variation was observed for Agricultural infrastructure (1002%) followed by Health infrastructure (246%) and the variation was least for Educational infrastructure (35%). Top positions were retained by the 4 metropolitan districts along with Hyderabad and Gandhinagar. New entrants into the top club were Bangalore and Kanpur Nagar. Infrastructure facilities seem to be lacking severely in Bastar, Jaisalmer, Barmer, Gumla, Kalahandi, Shahdol and Panna.

Intra-state Variation in Levels of Infrastructure

We now look at Intra-state levels and variation in infrastructural facilities. Table 4 gives the Average level and Coefficient of Variation exhibited by the different indicators of infrastructure.

It can be observed that in 1971, the top positions were held by Karnataka for AGINF, Tamil Nadu for TRINF, Haryana for POWINF, Kerala for FININF & HLTINF and Maharashtra for EDUINF. Bottom positions were occupied by Orissa for AGINF, POWINF & FININF and Himachal Pradesh for TRINF, EDUINF & HLTINF. The overall position regarding infrastructure was best in Kerala and worst in Himachal Pradesh and Orissa. During 1981 and 1991, overall Infrastructure facilities were good in Kerala, Punjab, Karnataka and Andhra Pradesh and poor in the states of Bihar, West Bengal, Rajasthan and Madhya Pradesh.

We are however more concerned with Intra-state variation in the levels of Infrastructure facilities. It can be noted that the intra-state variation is substantially high for many indicators and many states.

Highest intra-state disparity was observed during 1971 in the states of Uttar Pradesh and Tamilnadu for AGINF; TRINF in Uttar Pradesh and Rajasthan; POWINF in West Bengal and Bihar; FININF in Maharashtra and Madhya Pradesh; EDUINF in Madhya Pradesh and Rajasthan. Disparity among districts according to index of composite infrastructure was very high in West Bengal, Bihar, Andhra Pradesh, Madhya Pradesh and Rajasthan.

The situation was similar in 1981 when the intra-state variation was observed to be substantially high in Andhra Pradesh for AGINF, TRINF, and FININF; in Bihar for Power and Health Infrastructure, and in Uttar Pradesh for EDUINF. Composite indices of infrastructure facilities exhibited substantial unequal spatial spread in Bihar, West Bengal. Andhra Pradesh, Rajasthan and Uttar Pradesh.

During 1991, the trend continued and infrastructural facilities showed substantially high variation in Andhra Pradesh for AGINF, TRINF, FININF and HLTINF; in Bihar for Power Infrastructure and in Uttar Pradesh for Education Infrastructure.

It is also to be noted that the intra-state disparity is high in some states where the average level itself is low, e.g. Rajasthan, Uttar Pradesh, Madhya Pradesh and Bihar. This is of major significance since one can easily form a notion regarding the magnitude of lack of infrastructural facilities in some of the districts of those states. This also implies that these states are not only suffering from low average level of infrastructure, but also that there are only a few isolated privileged pockets in those states while the rest of the districts are lagging far behind. Moreover it can also be seen that intra-state variation seems to be low in the advanced states (i.e. states with high average value of the indicators). This implies that those advanced states have managed to improve their average level not by concentrating on a few isolated regions but by spreading the facilities more evenly across space. It thus comes out that the inequality is low at the upper end. To test whether the inequality follows any pattern, specially to check whether the intra-state variation depends on the average level itself, the mean level and the coefficient of variation were subjected to Correlation Analysis. It was observed (Table 5) that for the infrastructural indicators the coefficients are found to be negative and significant – specially for Transport and Power Infrastructure and the Composite indices INF2 and INF4. This indicates that intra-state disparity in availability of infrastructure decreases as the average infrastructure level of the state increases.

Thus it can be concluded that there exists considerable variation in the levels of Infrastructural facilities - across regions over the country and also within each state. At the national level, when all districts are considered, this variation, however, seems to be narrowing down over time as exhibited by the decrease in the magnitude of CV over time.

Stickiness in Hierarchy of Districts

A significant inference that can be drawn from the study of the levels of infrastructure is that there seems to be fairly strong concordance between the position of the districts over time. The districts obtaining top positions in 1971 seem to hold on to their positions in 1981 and 1991 also (barring a few exceptions).

To examine this issue of 'stickiness' in the position of the districts over time, two methods were used. Firstly, Rank Correlation Coefficient between the ranks secured by a district at 2 time points were calculated for each of the indices of infrastructure separately for 1971&1981 and for 1981&1991. The results are reported in Table 6. Also, the districts were classified into group 1, 2, 3, 4 and 5 depending upon whether they were in the bottom 20%, 20 - 40%, 40 - 60%, 60 - 80% and top 20% respectively. These classification groups were then cross-tabulated for the time pairs 1971-81 and for 1981-91 respectively, for each of the infrastructural indices. The diagonal elements of the crosstabulation will measure the frequency of the districts retaining their classes over time, while the off-diagonal elements will measure the shifts in groups by districts. Table 6 also shows the number of districts retaining their groups, and those shifting to lower and higher groups for the 2 time points.

On the basis of Table 6 it can be seen that the Rank Correlation coefficients are significant at 1% level for all the indices both for the period 1971-81 and for 1981-91. During 1971-81, highest stickiness was exhibited by transport infrastructure (0.854) and INF3 (0.854). Lowest concordance was exhibited by Health infrastructure (0.549).

During 1981-91 the Rank Correlation coefficient decreased for the infrastructural indices compared to 1971-81 indicating that during the period 1981-91 infrastructural facilities were spread more evenly, with newer districts improving themselves.

When the cross-tabulation results were looked into, it was observed that during the period 1971-81, substantial number of districts retained their groups. The highest number of retainment was for INF3 (239 out of Total 379) followed by INF1 (237) and Transport infrastructure (233). Various districts changed their groups during this period. Highest number of improvement (shifting from lower group to higher group) was exhibited by Agricultural infrastructure (126).

During 1981-91, lower retainment of groups was observed for the infrastructural indicators, specially for Educational and Financial Infrastructure, where the retainments were 98 and 103 respectively. Maximum cases of improvement were observed for Transport Infrastructure, where 142 districts shifted to a higher group in 1991 compared to 1981. Contrary to that, 140 cases shifted to a lower group for both Financial and Educational infrastructure.

It can thus be concluded that though various districts have shifted their positions, the hierarchy remains fairly similar over time. Thus, the narrowing down of regional variation in infrastructural facilities appears to have taken place along with substantial stickiness in the relative position of the districts.

This study aimed at studying the regional dimension of infrastructure at the district level. The major findings can be summarized as:

A. There exists considerable variation in the levels of infrastructure among the districts as well as in the levels of different components of infrastructure.

B. **This variation seems to be decreasing over time.**

C. **There exists considerable 'stickiness' in the hierarchy of the districts over time. Relative positions of the districts remain fairly similar over time for infrastructure levels.**

D. **The states are not homogeneous units. Substantial intra-state disparity in the levels of infrastructure and its components exists.**

E. **Intra-state disparity in infrastructural facilities is lower in states with higher average levels of Infrastructure.**

It can thus be concluded that Infrastructural situation in India is far from being comfortable. The inter-regional disparity is still too high to be complacent, and the hierarchy of the districts has remained much the same. We are facing several bottlenecks in specific infrastructural sectors also. This is proving to be a roadblock in our development process, and, unless we take up an active role, progress in the immediate future may be stalled. On top of that, new areas of concern (e.g. financing) have cropped up regarding further expansion of infrastructural facilities in India, specially to the backward areas. All these need careful study and only then proper policies can be framed so that development in India does not remain confined to isolated pockets but spreads far and wide. Proper identification of necessary projects, smooth and quick completion of construction, proper operation and profitable management of the services, and regular maintenance of them would help the economy to have an efficient infrastructure on which to build up the 'super structure' and to fulfil the objectives of balanced regional development.

Endnotes

[i] Some of the studies analysing development experience in India at the district level are Dasgupta (1971), Pal (1975) and Gayithri (1997).

[ii] This MODPCA method has been evolved by Amitabh Kundu *et al.* Refer to Kundu, A. (1980).

[iii] It is often argued that the mean used should not be the simple average of the indicators, but a weighted average of them, the weights being either area or population of the observations (districts or states), depending on which factor the indicator was standardized by. However here the purpose is to make the variables scale-free and express them relative to a common factor. Hence simple mean will serve our purpose.

[iv] This method of using average of factor scores has been questioned by methodologists, but has been widely used by researchers wanting to capture as much variation of the explanatory variables as possible. P.C. Sarker had used this method in his study on India. Refer to Sarker (1994).

[v] This method was first mentioned by M. N. Pal [Pal 1963, 1971]. For a study of this and related methods refer to Kundu and Raza (1982).

Appendix A- Data Sources

CSO - Statistical Abstract of India, Various Years

GOI - Basic Road Statistics, *Min. of Surface Transport, GOI,* Various Years

GOI - Education in India, *Dept. of Education,Min. of HRD, GOI,* Vol. I (s) and II (c), Various Years

GOI - Health Statistics in India, *Min. of Health and Family Planning, GOI,* Various Years

GOI - Identification of Backward Areas : Report of the Working Group, *Planning Commission,* February, 1969

GOI - Indian Agricultural Statistics, *Dept. of Agriculture and Co-operation, Ministry of Agriculture, GOI,*

GOI - Selected Educational Statistics, *Dept. of Education,Min. of HRD, GOI,* Various Years

GOI - Statistical Profile - Districts of India, *Multilevel Planning Section, Planning Commission,* 1974

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RBI - Banking Statistics - Basic Statistical Returns, Various Years

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Registrar General of India - B-series Tables - General Economic Tables, *Census of India, GOI,* 1971,1981,1991

Registrar General of India - Distribution of Infrastructural Facilities in Different Regions, Data on Floppy Diskette, *Census of India, GOI,* 1998

Registrar General of India - District Census Handbook, Town Directory, *Census of India, GOI,* 1971,1981,

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Appendix - B

List of Variables used for constructing Composite Indices at the District level

Agricultural Infrastructure – AGINF
Irrigation intensity – GIA as percentage of GCA - **IRR_INT**
Outstanding Bank Credit to Agriculture per 1000 Agricultural Workers - **AGR_CRED**

Transport Infrastructure – TRINF
Road length per 1000 sq. km area - **ROADS**
Railway length per 1000 sq. km area - **RAILWAY**
% of villages having Pucca Roads - **VILL_ROAD**
% of villages having post and Telegraph Offices - **VILL_POST**

Power Infrastructure – POWINF - % Of Villages Electrified

Financial Infrastructure – FININF
Bank branches per 1000 sq. km area - **BANK_BR_1**
Bank branches per 10000 population - **BANK_BR_2**
Bank credit per 10000 population - **BANK_CRED**
Outstanding Bank Credit to Industries per 1000 Workers in Manufacturing sector - **CRED_IND**

Educational Infrastructure – EDUINF
% of villages having Educational facilities - **VILL_EDU**
Primary Schools per 1000 sq. km area - **PRI_SCH**
Secondary Schools per 1000 sq. km area - **SEC_SCH**
Colleges per 1000 sq. km area - **COLLEGE**

Health Infrastructure – HLTINF
% Of Villages having Medical Facilities - **VILL_MED**
% Of Villages having Facilities of Drinking Water - **VILL_WTR**
Urban beds per 1000 urban population - **U_BEDS**
Hospitals and Dispensaries per 1000 sq. km area - **HOSP_1**
Hospitals and Dispensaries per 10000 population - **HOSP_2**

Medical Personnel per 10000 population - **MED_PERS**

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